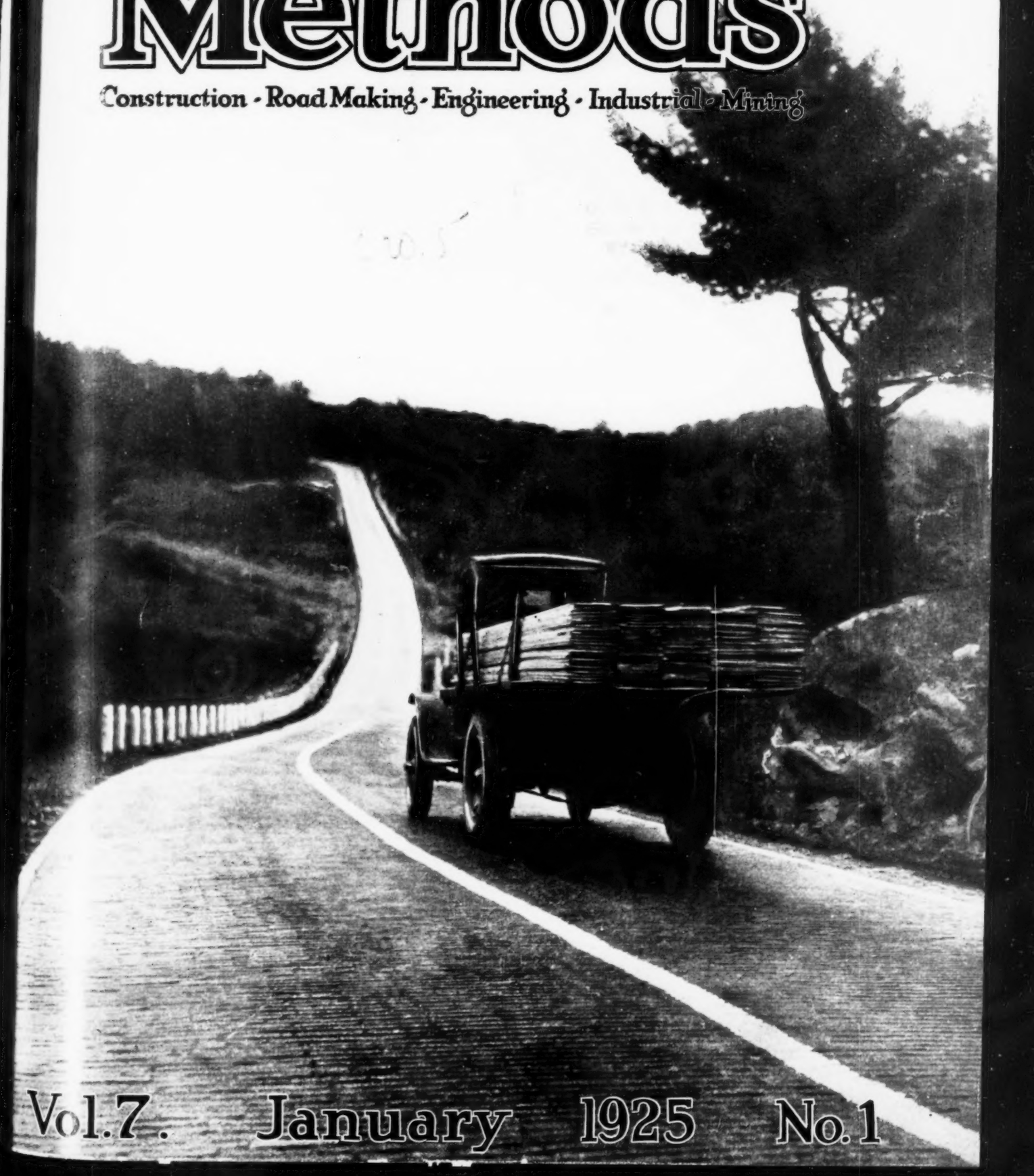
Successful Methods

Construction - Road Making - Engineering - Industrial - Mining



Vol. 7. January 1925 No. 1

Successful Methods

A Magazine of Construction Service

Published by SUCCESSFUL METHODS, Inc.

S. T. HENRY, President — WILLIAM JABINE, Secretary and Editorial Director

141 Centre St., New York City, N. Y.

Vol. 7 — JANUARY, 1925 — No. 1

Out in the Cold and the Rain and the Snow

SO ran a line in a ragtime song that was popular before the days of jazz. It applies well to an untold value of construction machinery just at this moment. One need not travel far to find many sad examples of the neglectful manner in which too many construction men store their equipment during the off season.

The case of a Northern road contractor in a Southern State will illustrate. We recently happened to see what he had done with an entirely new plant that he used on a concrete road job last season. His mixer was out in the open covered with a tarpaulin. The gearing and drive were largely exposed, but the boiler did have a board over the stack. All the rest of his equipment, including a big crane, a bucket loader and a road roller were right out in the weather.

This seemed to be such an extreme case that we decided to look around a bit for more evidence of neglect. There was no trouble to find it. In fact, more or less of it was evident on nearly all of the eleven jobs afterward visited.

Such neglect is little short of an economic crime. It is one of the main reasons why contracting is properly considered by financial men to be a hazardous business. The worst of it all is that there is no rhyme nor reason for it. Pure shiftlessness is the best description of it.

Right now is the time to go over all your plant and equipment. Have your men carried out your instructions properly to house them? Better make sure by seeing for yourself.

Credit Where Credit Is Due

THE proper distribution of credit for the success of construction and material-handling jobs often is hard to place. This is particularly true in these days of complicated mechanical equipment and of operating schedules which involve so many different organizations. One thing sure is that the days of the one-man Cappy Ricks stunts are passed. More and more it is necessary to have an organization and to rely on it.

Managers and superintendents of construction and material-handling jobs too frequently consider that hiring a lot of experienced men is the way to get results. That certainly is the right start. But good men, consciously or unconsciously, work for more than pay alone. They want to know that their efforts are appreciated. They do not ask to be petted. But when the outfit makes a good record, every man on that job deserves and should get his share of the credit for it.

Failure to observe this fact causes more trouble than most of us stop to realize. And this trouble generally starting toward the top, usually goes right down the line. If the engineer in charge tries to take all the credit for a record for which a good construction superintendent is largely responsible, you can bet that every man in the camp will be sore. What is more, that soreness certainly will cause trouble sooner or later.

Few men are big enough to realize that the success of those under them means their success. Leaving out the justice of the thing altogether, it is wise to be sure that your good men get full credit for all they do. It does not cost much for them to receive it, but it may be mighty expensive to try to hog it from them.

An Announcement

BEGINNING with this issue, SUCCESSFUL METHODS passes into the ownership of S. T. Henry and William Jabine. Mr. Henry has been vice-president of the organization from its inception. Mr. Jabine has been on the editorial staff from the first issue, and for four years has been the editor.

The new owners contemplate no important changes in the policies of the publication. They will endeavor to produce a paper which will merit reading. They have no extravagant ideas of revolutionizing the methods used on construction work and in handling materials. They do hope to be of some service by showing with good pictures and brief, common-sense articles how the other fellow saves money doing your kind of work.

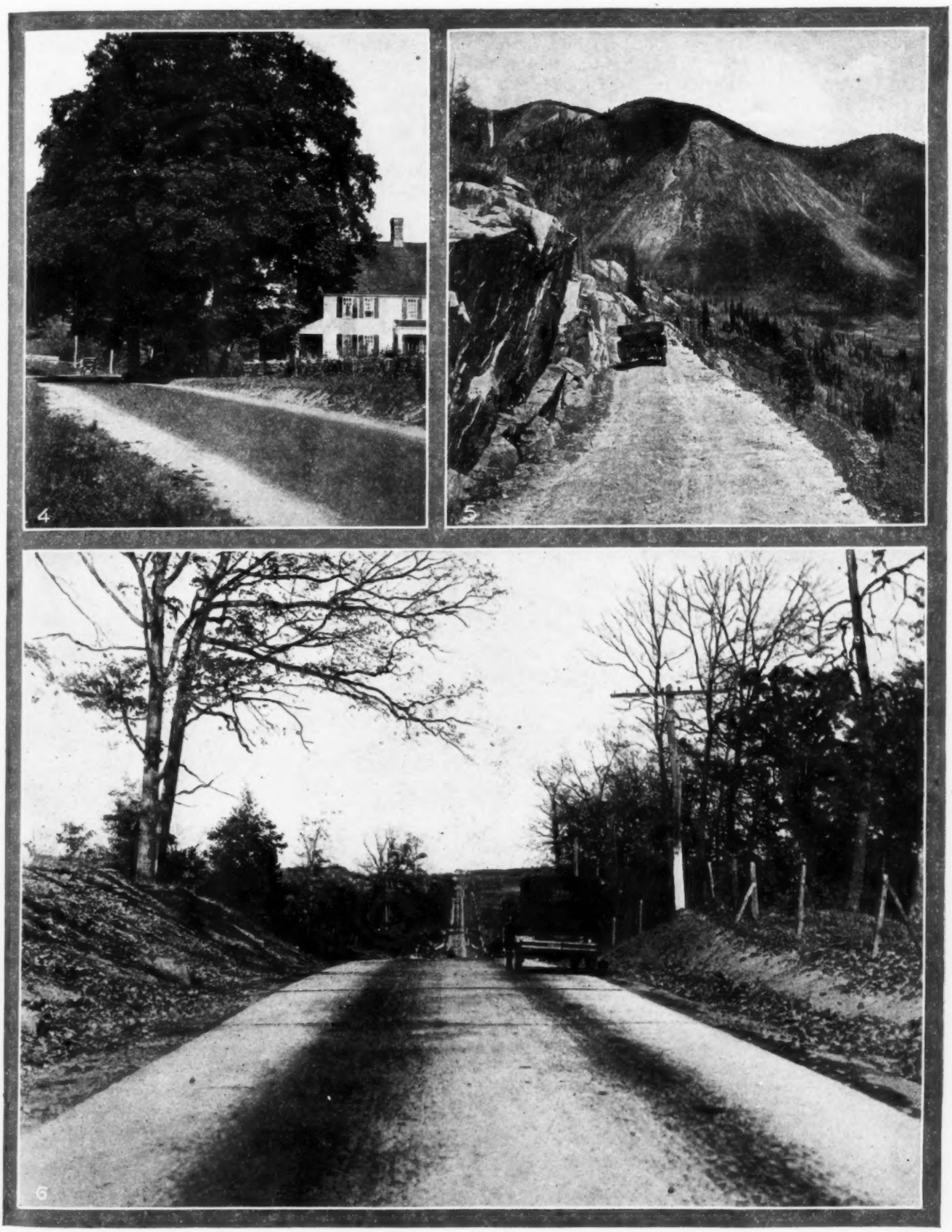
Successful Methods Is Free

SUCCESSFUL METHODS is sent free of charge to 40,000 men engaged in various branches of the construction and material-handling industries. If you desire to receive the magazine, send us your name, the address to which you wish it sent, and your occupation. If you are with a company, tell us what position you hold with the firm.

American Road Builders

1. The grading gang at work. © *International*
2. Clearing the right-of-way for a Canadian road. © *Keystone*
3. The last step in road building. Putting on the surface. © *U. S. Bureau of Public Roads*

And Their Handiwork



4. A New England road. © *U. S. Bureau of Public Roads*
5. This is the sort of road that Colorado builds through the mountains.
6. A typical highway in Maryland. © *Keystone*

NEW BRIDGE WILL END TRAFFIC JAM

Structure Across Raritan River Costing Nearly $4,000,000 Will Clear Way to New Jersey Shore Resorts

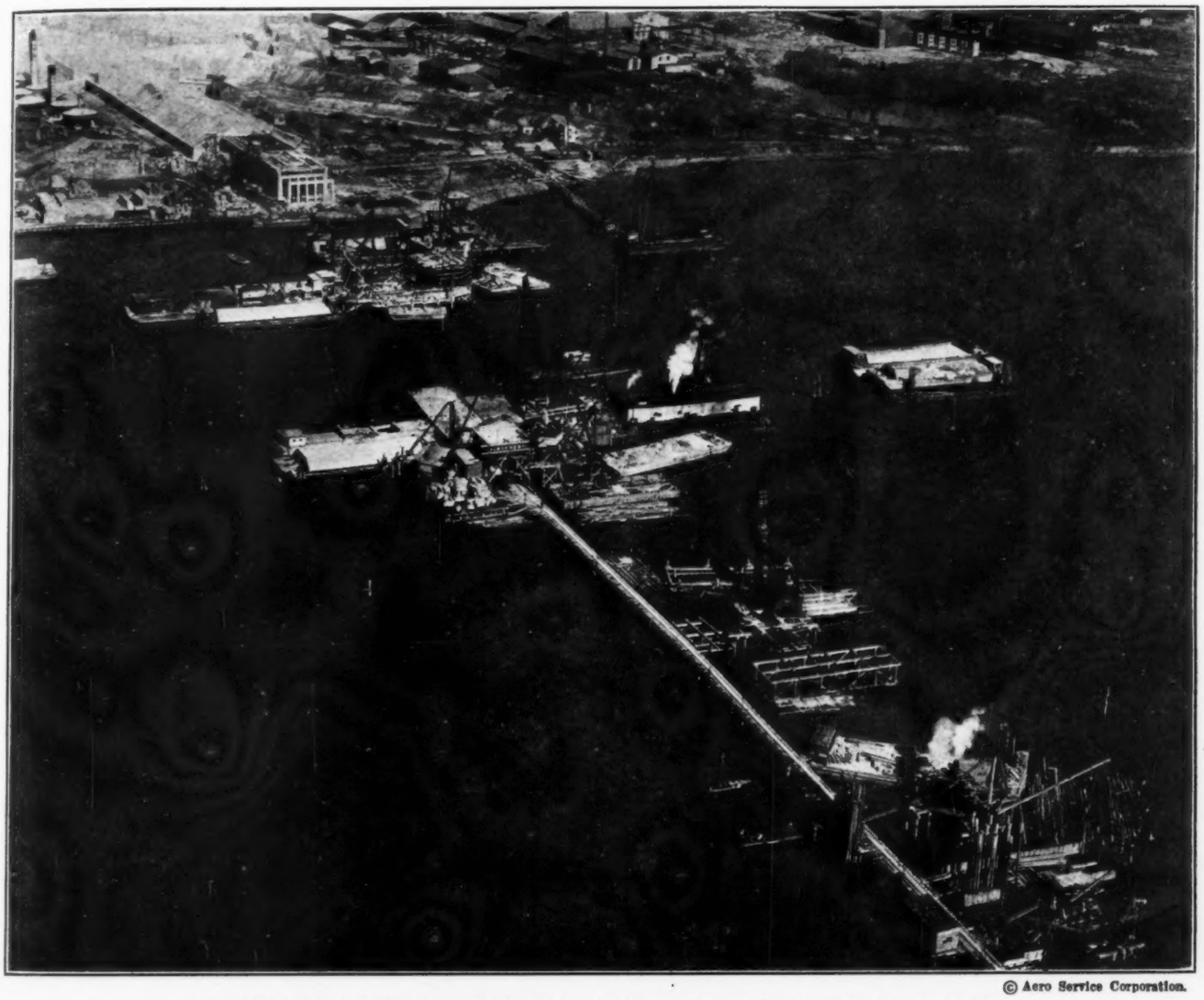
THE strengthening of the weak spots in a State highway system is fully as important as the laying out and construction of new routes, although this fact is not always recognized, and often considerable sums are spent on new construction while some "bottle neck" which checks the flow of traffic is left undisturbed. The volume of this flow has been frequently measured and an actual count made last August showed that between the hours of 6 a. m. and 10 p. m., 17,261 vehicles passed over the old bridge.

Major W. G. Sloan, State Highway Engineer of New Jersey, is a believer in spending money where it is most needed, whether he is building a new route or eliminating a weak spot in an old one. At present the biggest single job in progress under the direction of the State Highway Commission is the Amboy Bridge across the Raritan River, between Perth Amboy and South Amboy. This structure will replace an old highway bridge which has proved itself inadequate to handle the immense volume of traffic which uses the route to the Jersey coast resorts. In addition to providing a wider roadway, the clearance of the new bridge above the water is so much greater than that of the old bridge that it is estimated that the number of times the bridge is opened will be reduced by at least two-thirds.

The contract for the new bridge was let on Dec. 11, 1923, to the Stillman-Delehanty-Ferris Co. of Jersey City, and work began almost immediately. The cost of the bridge will be $3,702,921 and the contract provides that it be finished in 30 months. The work has progressed to such an extent that it probably will be finished within the contract time and will be ready for traffic in the spring of 1926. The general contractors are building all but the river piers, which are being constructed by the Foundation Company. The steel work for the draw and approaches

© Aero Service Corporation.

AT WORK ON THE NEW BRIDGE. THE OLD STRUCTURE IN THE BACKGROUND



© Aero Service Corporation.

A PHOTOGRAPH OF THE WORK THAT LEAVES NOTHING TO THE IMAGINATION

will be put in place by the Bethlehem Steel Company.

The bridge, including approaches, is 8500 ft. in length. Of this, 1077 ft. consists of reinforced concrete viaduct, 1536 ft. of steel spans including 16 plate girder spans and one draw span 360 ft. in length. The approaches at each end, measuring in all about 5536 ft., consist of earth fills. The bridge structure will rest on 55 piers. Of these, Piers 1 to 9 inclusive and 25 to 55 inclusive are in the meadows at each side. Piers 10 to 28 inclusive are in the river, and all except Piers 13, 14 and 15, which go to rock, are constructed on piles. Approximately 300,000 lin. ft. of piles have been driven.

Work on the bridge began with the construction of the earth fills at each end, about 150,000 yd. of material being brought from neighborhood borrow pits by truck. As all of the material other than the earth for the fills had to be brought in by water, a pier was constructed on the bank of the river to which sand, stone and cement were brought in barges. These barges were unloaded with a crane and the materials dumped into measuring bins on the dock. The mixer was placed under the bins and the concrete into bottom dump batch boxes on cars hauled by a gasoline locomotive running on narrow-gage industrial track. This track paralleled the work on the south side of the river and all of the piers in the meadows were poured by this method. The batch boxes were lifted from the cars by a locomotive crane running on a track parallel to the narrow-gage track. The piers on the north side were poured in much the same manner, although in this case the dock on which the mixing plant was situated was built further out in the stream. These two plants took care of the pouring of all of the piers, except those constructed by the Foundation Company. This meant the pouring of approximately 50,000 yd. of concrete.

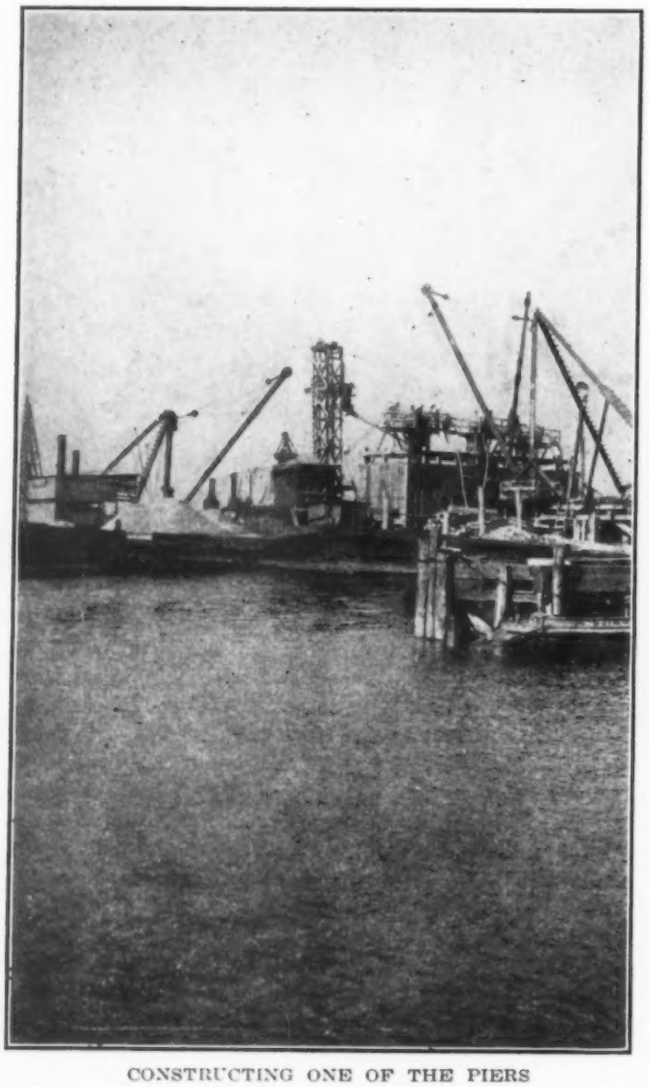
The central piers constructed by the Foundation Company, including the pivot pier on which the draw span will rest, have been built by the air caisson method. The caisson for one of the rest piers established a new record in American bridge construction, as it is being sunk 115 ft., a greater depth than that of any other bridge pier in the United States. The Foundation Company has established its own mixing plants.

The work being done by the Foundation Company consists of the construction of the six river piers. Nos. 13, 14 and 15 are by the pneumatic caisson method and Nos. 11, 12 and 16 with pile foundations in open coffer dam.

All pneumatic caissons are carried to rock and the pile foundation piers constructed in open coffer dams. The caissons used are of the most modern type and equipped with the best and latest devices for handling men and materials into and out of the working chamber.

Both the piers resting on the rock and those resting on piles are of concrete and are to be faced with rock faced granite. The amount of excavated material for the piers constructed by pneumatic caisson is about 2200 cu. yd. in pier 13, 5700 cu. yd. in pier 14, and 3900 cu. yd. in pier 15, all excavated under air pressure. The amounts excavated in the open coffer dams were 1100 cu. yd. from pier 11, 1500 cu. yd. from pier 12, and 2400 cu. yd. from pier 16.

The amounts of masonry laid, including concrete and granite, are as follows: Pier 11, 1300 cu. yd.; pier 12, 1900 cu. yd.; pier 16, 1700 cu. yd.; pier 13, 2800 cu. yd.; pier 14, 7500 cu. yd.; pier 15, 3700 cu. yd.

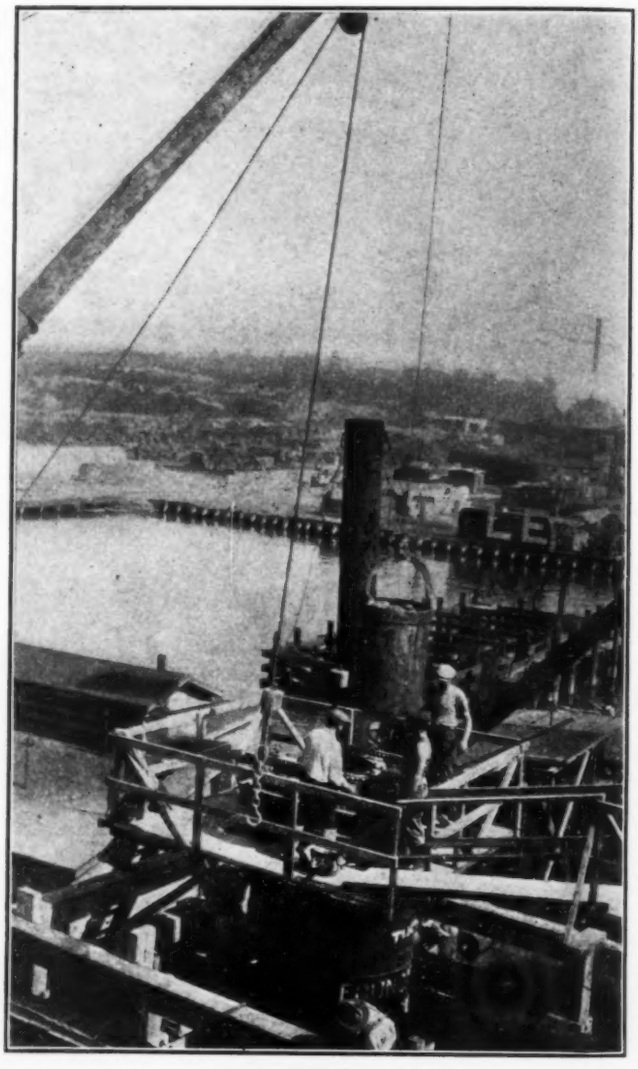


CONSTRUCTING ONE OF THE PIERS

The open coffer dams were of steel sheet piling and varied in depth from 28 ft. to the unusual depth of 45 ft., and in size from 23 by 76 ft. to 30 by 78 ft. After the piles were driven the coffer dams were sealed with concrete before the piers were poured.

The two resting piers were built in rectangular caissons 17 by 62 ft., and the pivot pier is being poured in an octagonal caisson with a short diameter of 50 ft. One resting pier and the pivot pier will rest on rock at a depth of about 92 ft. The other resting pier, as said before, goes to the record depth of 115 ft.

The piers are at a height to permit a clearance in the fairway of 28 ft. The fairway on each side of the pivot pier is 140 ft. clear and will be dredged to a depth of 30 ft.



VIEW OF LOCK NO. 1

The work of the Foundation Company began March 1, 1924, and will be completed early in 1925.

The excavation problem was difficult as the area for depositing the excavated material was restricted.

The completed bridge will carry a roadway 38 ft. in width between curbs, with a 5-ft. sidewalk on each side. The road bed will be built of reinforced concrete carrying an asphalt block pavement except on the earth fills, where a concrete surface will be laid.

George S. Yeomans is resident engineer for the contractors and Tom Morris is superintendent. Clarence W. Hudson is supervising engineer and A. B. Piver is resident engineer for the State.

The New Jersey Legislature by special act has designated the new bridge as the Victory Bridge.

RECORD CROWD EXPECTED AT ROAD SHOW

Highway Builders from Every Section of the Country Planning to Attend A. R. B. A. Meeting

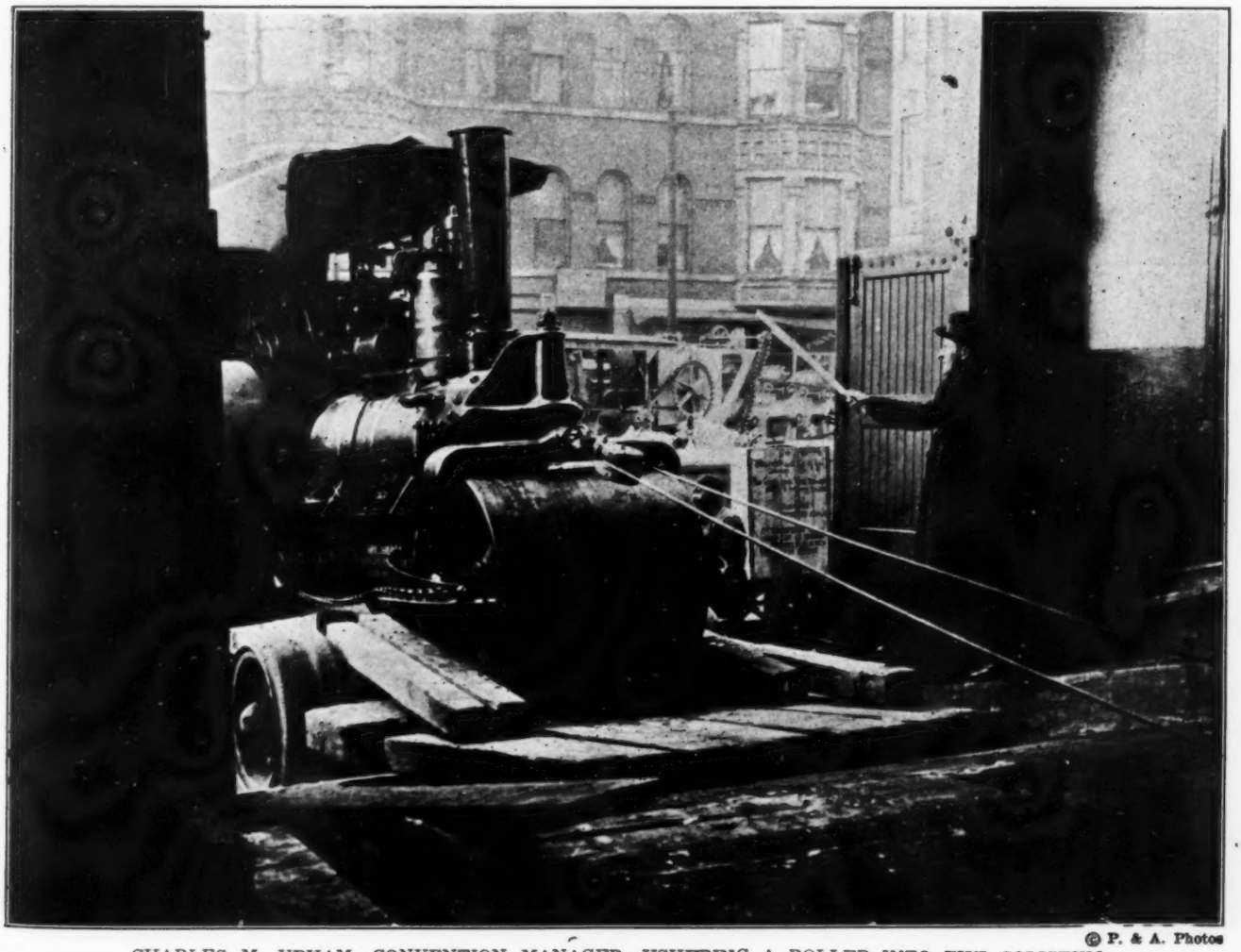
MEN interested in highway construction from every section of the country will gather in Chicago, Jan. 5 to 9, for the annual Convention and Road Show of the American Road Builders' Association. This organization, which has been in existence for more than twenty years, has made its convention and show one of the most important assemblages in the entire country. Last year more than 15,000 persons registered at the Road Show and an even greater number are expected this year.

The officers of the association are: President, J. H. Cranford; Secretary, E. A. Birchland, and Treasurer, James H. MacDonald. The sessions of the convention will be held at the Congress Hotel and will be open to any one interested in the highway industry. The show in the Coliseum and adjoining buildings will include road-making machinery of all kinds and in addition, publishers, suppliers and others identified with road building will have exhibits.

The program prepared by Prof. T. R. Agg of the Iowa State College provides a series of discussions of highway problems that will prove invaluable to all who attend. There will be five sessions of the convention which begins on Tuesday, Jan. 6, and ends on Thursday, Jan. 8. The show will open a day earlier and will last a day longer.

Among the speakers will be: Thomas H. MacDonald, Chief of the United States Bureau of Public Roads; Arthur H. Blanchard, Professor of Highway Engineering and Highway Transport, University of Michigan; Frank T. Sheets, Chief Engineer of the Illinois State Highway Commission; Frank Page, Chairman of the North Carolina State Highway Commission, and W. H. Connell, Engineering Executive and Deputy Secretary of Highways of Pennsylvania.

Convention headquarters will be maintained at the Congress Hotel and also on the balcony of the Coliseum. The Entertainment Committee has provided a series of events which will keep the visitors occupied when they are not attending the convention and show. All of the official news of the convention and show will be printed daily in the *Highwayman*, a newspaper which has been published for the last two years and distributed free of charge.



© P. & A. Photos

CHARLES M. UPHAM, CONVENTION MANAGER, USHERING A ROLLER INTO THE COLISEUM

POWER COMPANY BUILDS MOUNTAIN ROAD

Cuts Through Wilderness in Preparing Way for New Hydro-electric Development in California

THE various State highway departments are not the only organizations which have road building problems to solve. The San Joaquin Light & Power Company, which is engaged in the development of hydro-electric power in the central part of California, has been building a road for several years through almost impassable country. This road is being put through in order to provide access to points in the valley of the northern fork of King's River, where a 450,000-hp. hydro-electric project is to be developed.

The road connects no towns, but is simply being built as the only practicable means of getting supplies to the places where construction will go on in the next few years. This road was begun in 1919, but little was done on it until the beginning of the 1923 season. At that time the job was well organized and since then about 20 miles of road have been built. The average width of the road is 16 ft. and the photographs which illustrate this article describe the character of the country far more clearly than words can.

Much of the work has consisted in cutting a shelf in the side of the canyon. The method followed has been to send the drill gang ahead, and this has meant work in almost inaccessible places. These men have worked with seven large air drills supplied through 3-in. pipe by five gasoline-driven portable compressors which are stationed on the road about three-fourths of a mile back. The drill gang is followed up at a safe distance by the powder gang and still further back is a steam shovel which clears away the broken material. The compressors are, of course, back of the shovel.

About 65 men have been employed on this work, living in portable camps. These camps are so arranged that it has been possible to move them in 1½ days without interfering with the progress of the work and with no extra help. Many of the men have their families with them in the camps.

The fuel used in the steam shovel is wood obtained in clearing the right-of-way. The shovel is mounted

ROAD BUILDING UNDER DIFFICULTIES

on crawler traction and has taken care of the removal of the loose rock without difficulty.

All of the supplies and equipment for the work have to be brought in by pack trains. Piedra on the Santa

PACKING IN SUPPLIES

Fé Railroad is the nearest point reached by railroad and from there supplies are hauled by trucks or teams over about 25 miles of road to the camp. About half of this road is county road and the remainder was built by the company several years ago. A bridge was built across the main river at the present camp in 1921. This bridge consists of two 100-ft. wood trusses. Several of the photographs show some of the difficulties encountered by the drilling gangs at various points on the rocky hillside. The photograph at the right on page 10 shows a wooden trestle that was con-

THE DRILLING GANG ON AN AIRY PERCH

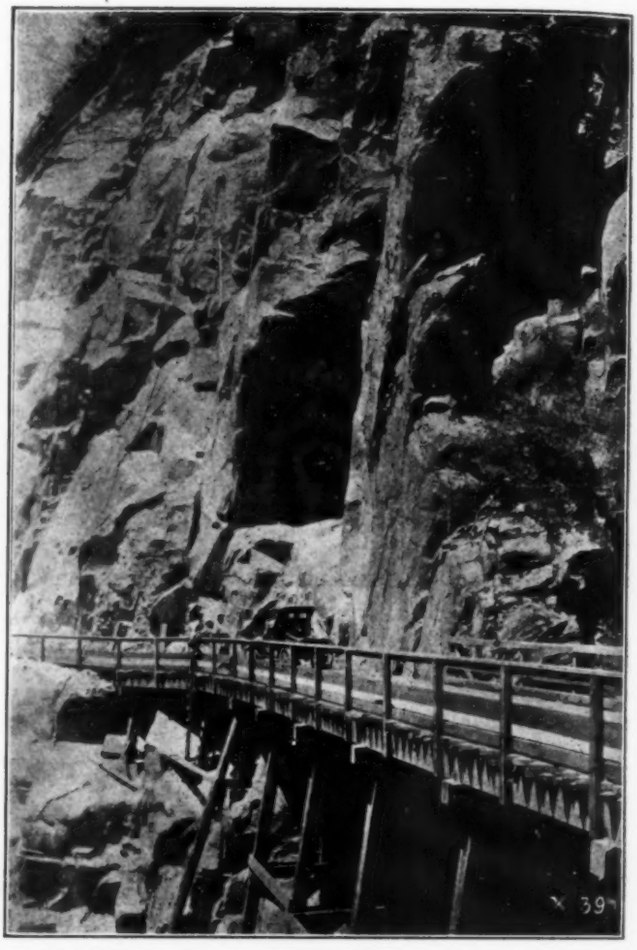
A TYPICAL JOB ON THE FRONT LINE

structed at one point where the cost of cutting a bench in the rock was prohibitive because of the steepness

THE MEN HAD TO WORK IN ALL SORTS OF PLACES

of the face of the cliff. This trestle has proved satisfactory for bridging that section of the steep cliff.

In many States road builders find themselves up against difficult problems in the construction of mountain roads, but modern machinery furnishes such competent aid in making the necessary cuts or fills that the work is carried on not only with speed, but without a great deal of danger to the workers.



A WOODEN TRESTLE CARRIES THE ROAD ACROSS THE FACE OF THE CLIFF AT THIS POINT

In building this road the men performed tasks that in other days would have been quite hazardous, but which in these days are accomplished with safety.

HIGH SPEED BRIDGE WORK SAVES INDIANA $200,000

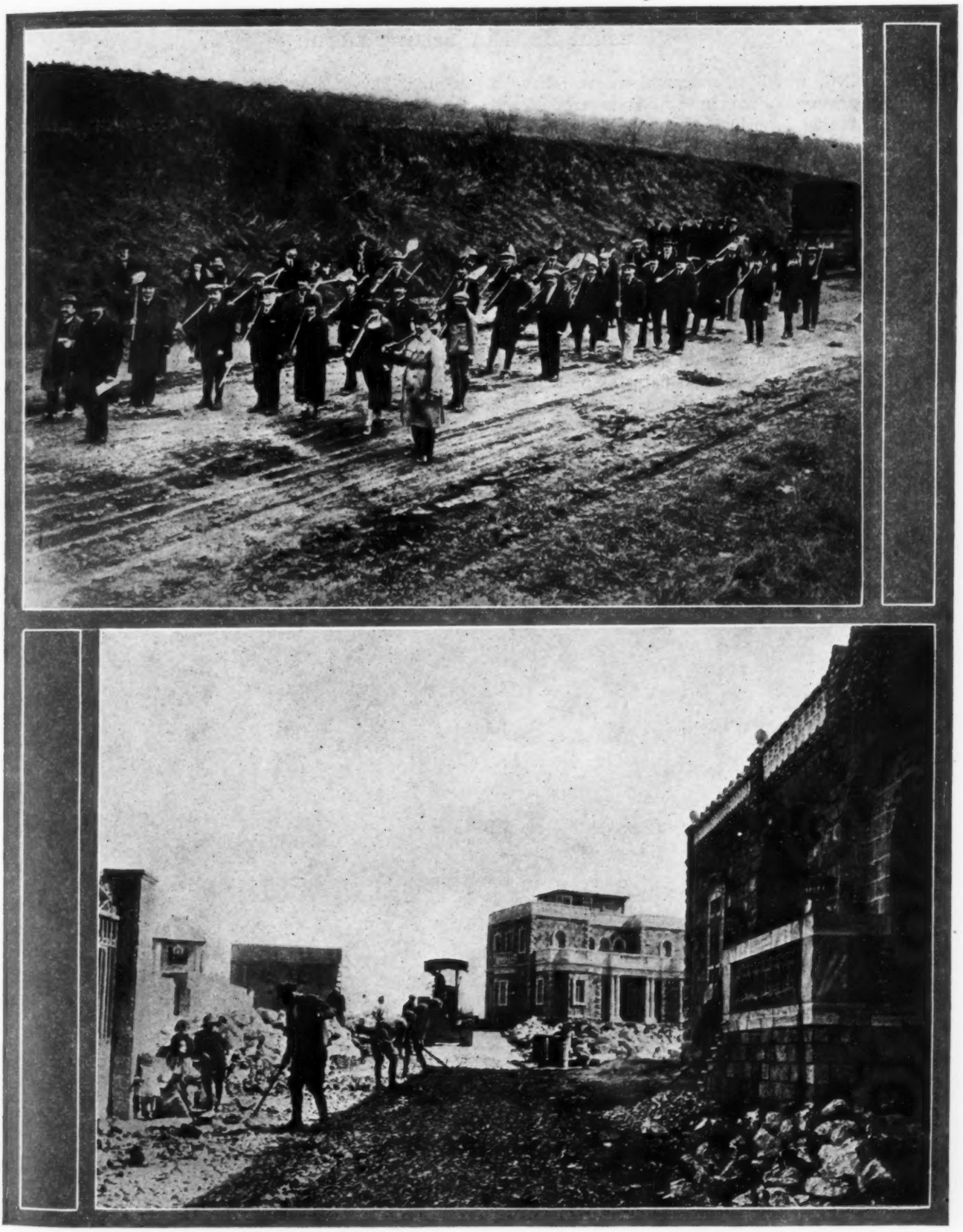
THE reclamation of one of the largest bridges in the State highway system without interrupting either vehicular or interurban traffic and thereby saving the State $200,000, the cost of a new bridge, was the feat accomplished recently by the Indiana State Highway Commission. The work was completed in 29 days and at a cost of $20,000, which is just a fraction of what a new bridge would have cost the State.

The work was let to contract but was carried out under the plans and supervision of William J. Titus, chief bridge engineer of the Commission.

In 29 days workmen tore up and built a new wood-block floor, respaced and riveted the old longitudinal stringers, adding two new lines of stringers the entire distance of the bridge, cleaned, brushed and spread three coats of paint on all steel iron work. This was accomplished without interrupting traffic both vehicular and interurban, as only one side of the floor was removed at a time. During the repair period the interurban line crossing this bridge also replaced its old rails with larger ones and raised these and their supporting stringers in order to place the top of the rails at the same elevation as the new bridge floor. Work was more difficult by presence of the high tension trolley supported on the super truss members.

This bridge is 618 ft. long and has a clear width of 20 ft. The work was completed at a cost of only a fraction of what a new bridge would cost, and the structure now is in condition to handle safely heavy modern traffic for a period of 20 to 25 years.

Road Builders of Other Lands



Members of the Automobile Club of Belgium ready to go to work on one of the roads near Brussels. © *P. & A. Photos*
Constructing streets in Jerusalem. The work is being done by the Jewish labor organization, Solel Boneh. © *International*

NEW BUILDING EMBODIES REFINEMENTS OF CLASSIC ARCHITECTURE

Philadelphia Museum of Art Follows Greek Rules of Curvature and Demands Unusual Skill in Setting Stone

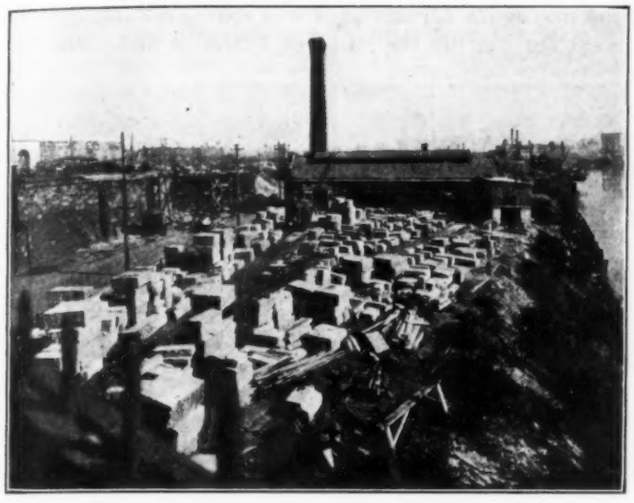
A BUILDING, which when completed will have a place among the monumental structures of the country, is taking form in Fairmount Park, Philadelphia. Begun several years ago when the foundations were put in under a separate contract and work suspended until last year, the construction of the Philadelphia Museum of Art is now going forward. The George A. Fuller Company is putting up the north and south pavilions of the museum and the contract under which the work is being done also includes the erection of all but the central pavilion. When the present work is completed a new contract will be let for the remainder.

There is probably no building in the country which has called for such careful and painstaking work by the builders. The architects, Horace Trumbauer, C. C. Zantzinger and C. L. Borie, Jr., associates, of Philadelphia, have followed in their plans many of the Greek rules of curvature which are not usual in modern construction. In fact, they have combined in this one building a number of the characteristics of classic architecture that are not found together in any other modern work.

The building is exedra shaped and covers an area of 533 ft. 6 in. by 425 ft. 6 in., the distance around the outside walls being 2673 ft. at the ground level, a little more than half a mile. The walls work out the refinements in curvature of the old Greek buildings. Some of them are concaved 8 in., and some convexed 5 in. Some of them batter 3 in., while at the end of the pavilion walls the beds of the courses are curved upward 5 in. The columns not only lean toward the building 2½ in., but also lean toward each other and in other respects the rules worked out by the Greeks

ONE OF THE MINNESOTA QUARRIES THAT IS PRODUCING THE STONE FOR THE PHILADELPHIA MUSEUM

to counteract the defects of human vision have been carefully followed. The result has been that J. F. Manning, vice-president of the George A. Fuller Com-

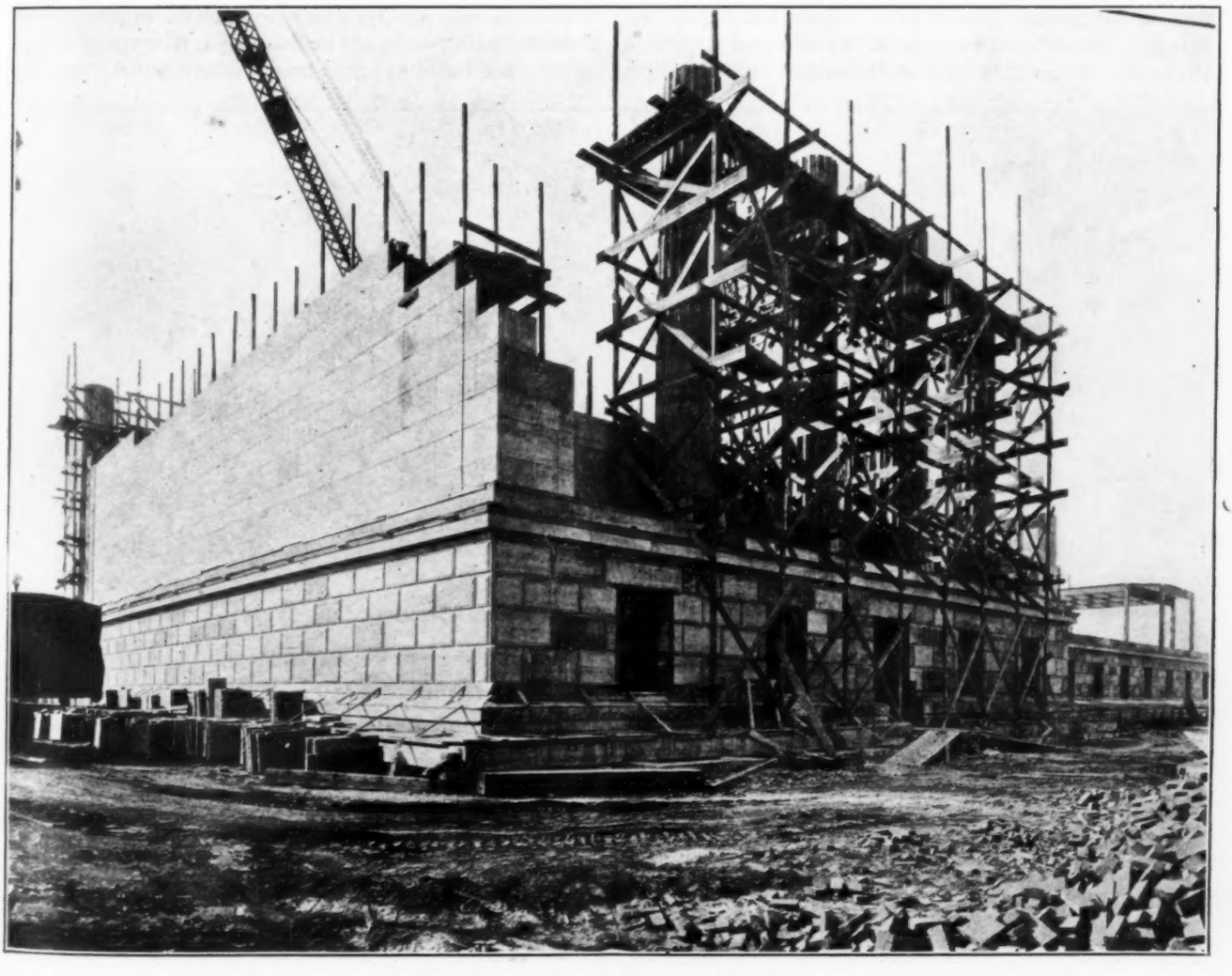


CUTTING YARD WITH SHOP IN BACKGROUND

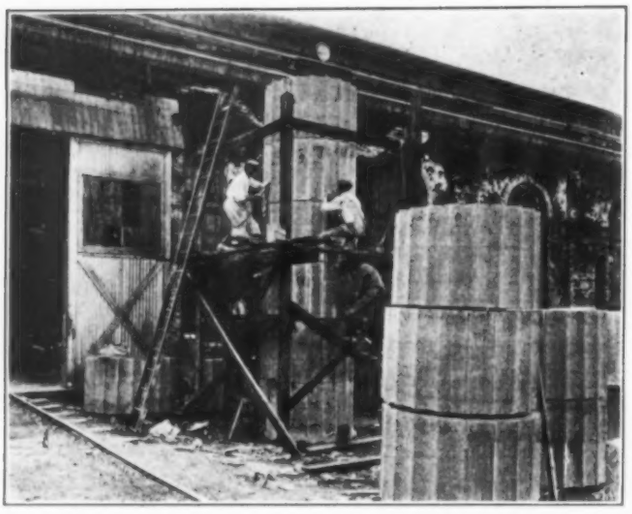
pany, who is in charge of the work, has had on his hands one of the most difficult jobs which he has encountered in his long experience. As Mr. Manning had charge of the construction of such notable buildings as the Denver Post Office, the Lincoln Memorial at Washington, the Arlington Amphitheater and the New York County Court House, his statement that the Philadelphia Museum has given him an opportunity to do some new thinking, is a good indication of the problems which he has had to solve.

FINISHING THE STONE INDOORS

The stone used for the Museum is a Minnesota



ONE OF THE END PAVILIONS SHOWING THE CHARACTE R OF THE ARCHITECTURE

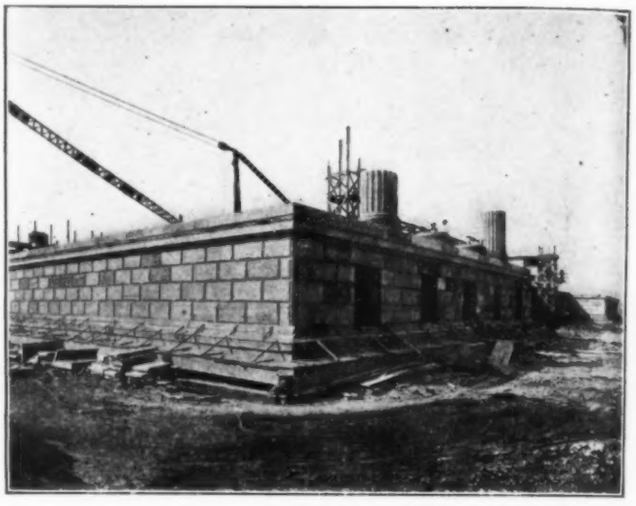


SETTING UP COLUMNS IN YARD BEFORE STONE IS SENT TO BUILDING

marble with a warmth of coloring which will make the new building differ from other monumental structures. This stone, which is being quarried at Mankato and Kasota, Minn., occurs in five shades: gray, cream, pink, buff and yellow, and these shades have been carefully blended in the walls of the Museum.

Work on the present contract began April 15, 1924, and is at present about two months ahead of the schedule for completion. As stated before, it includes the stone on the first floor of the entire building with the exception of the central pavilion and both of the end pavilions, which are about 100 ft. in height. It does not include the interior finish.

The contract was signed the latter part of March, and one of the biggest jobs was the installation of the plant for cutting the stone to final size and form. It



IN PLACE ON BUILDING

so happened that the Park Commissioners had on their hands an old electric railway power house, which stands on the banks of the Schuylkill River, and which with other buildings will later be torn down when the

THIS BASE COURSE SHOWS CONCAVE LINES OF WALL

park is extended to the river bank. This building was turned over to the George A. Fuller Company for its stone working shop and has proved ideally suited for the purpose. The job of assembling the necessary machinery was at once begun and the machines were installed and the job put in operation on May 12. The marble is brought in by rail to the West Philadelphia station of the Pennsylvania Railroad and from there taken to the job by motor truck. After being cut and trimmed to its final size it is then taken a short distance by truck and placed on the building.

Several of the photographs accompanying this article show the operations of the shop. Some of them are conducted indoors and in addition a considerable force is at work in the yard beside the building. The machine force indoors has been working in two shifts from the beginning and the shop has been in operation every day from 7 a. m. to 5.30 a. m. The big drums for the columns are cut and shaped in the shop and then are set up outside before being taken to the building. This is done in order to get them in final shape before they are put in place so that no further trimming will be necessary after they are in place. Altogether 520 of these drums are required.

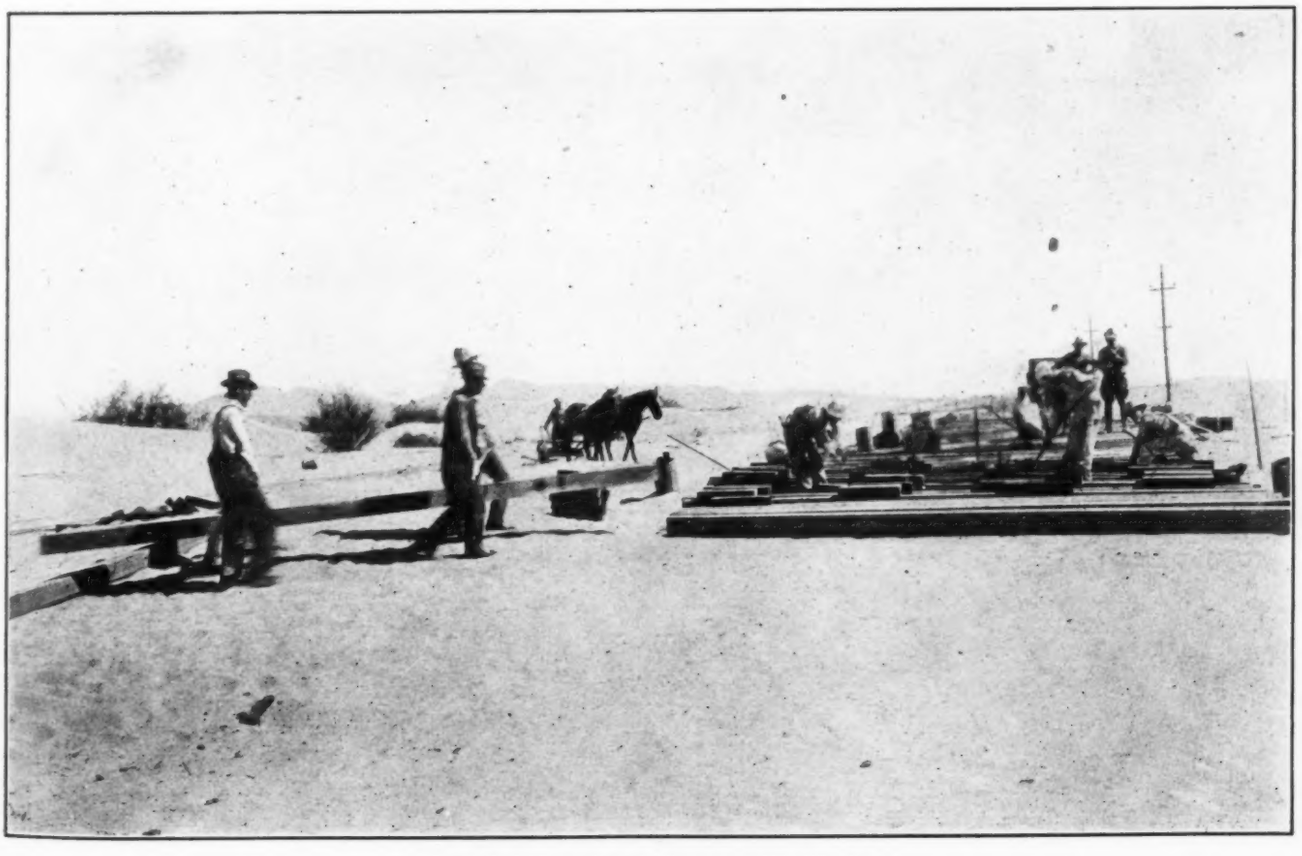
About 100 men have been employed at the shop and about 60 are employed at the building placing the stone. Mr. Manning is in general charge of the operations. George B. Taylor, who has been associated with Mr. Manning for a number of years, is the General Manager, and M. A. Liston is General Superintendent.

REDWOOD TIMBER TESTED ON DESERT HIGHWAY

THE durability of redwood is counted on by the California State Highway Department to solve the highway problem in the dune region of Imperial County, west of Yuma, Ariz. In this desert tract the sands shift with every strong wind, covering up the highways and making it necessary to use scrapers.

To fight these shifting dunes a new method of road construction is having a thorough test on a strip of highway 2000 ft. in length. Half of the test unit is 18 ft. wide; the other half, 10 ft. This unit is part of the State highway that crosses the sand dunes where they are 6½ miles wide and is the only outlet over the southern route to the east within United States territory.

The redwood timbers are separated by spacers so placed as to form a track and continuous path for vehicles. The timbers are held together by bolts. These hold the sections together firmly and yet permit considerable elasticity, so that the structure will not be under too much strain due to possible expansion during the periods of intense heat such as the desert experiences. Building the highway in sections makes it an easy matter to remove timbers when it becomes necessary to replace them.



SETTING REDWOOD TIMBER ON DESERT

TURNING THE FIRST SOD

Steam Shovel Plays Prominent Part in Brooklyn Ceremony and Then Settles Down to Work

EVEN the steam shovel was dressed up on the occasion of the digging of the first shovelful of earth for the new municipal building in Brooklyn. The duty of turning over the first piece of sod fell to Borough President Edward Riegelmann, who discarded the time honored spade and used a steam shovel for the job.

The upper photograph shows Judge Riegelmann operating the shovel and depositing the first dipper load of earth in a motor truck. He handled the big machine like a veteran.

THE FIRST SHOVELFUL

The photograph at the bottom of the page shows what a pair of steam shovels can do when they are turned loose. The two shovels in the photograph are owned by the George J. Atwell Company of Brooklyn, and at the time the picture was taken they were hard at work finishing the job which Judge Riegelmann had so ceremoniously begun. The new building when completed will house 27 city departments.

GETTING DOWN TO REAL WORK

CONVEYOR EARNS KEEP IN GRAVEL PITS

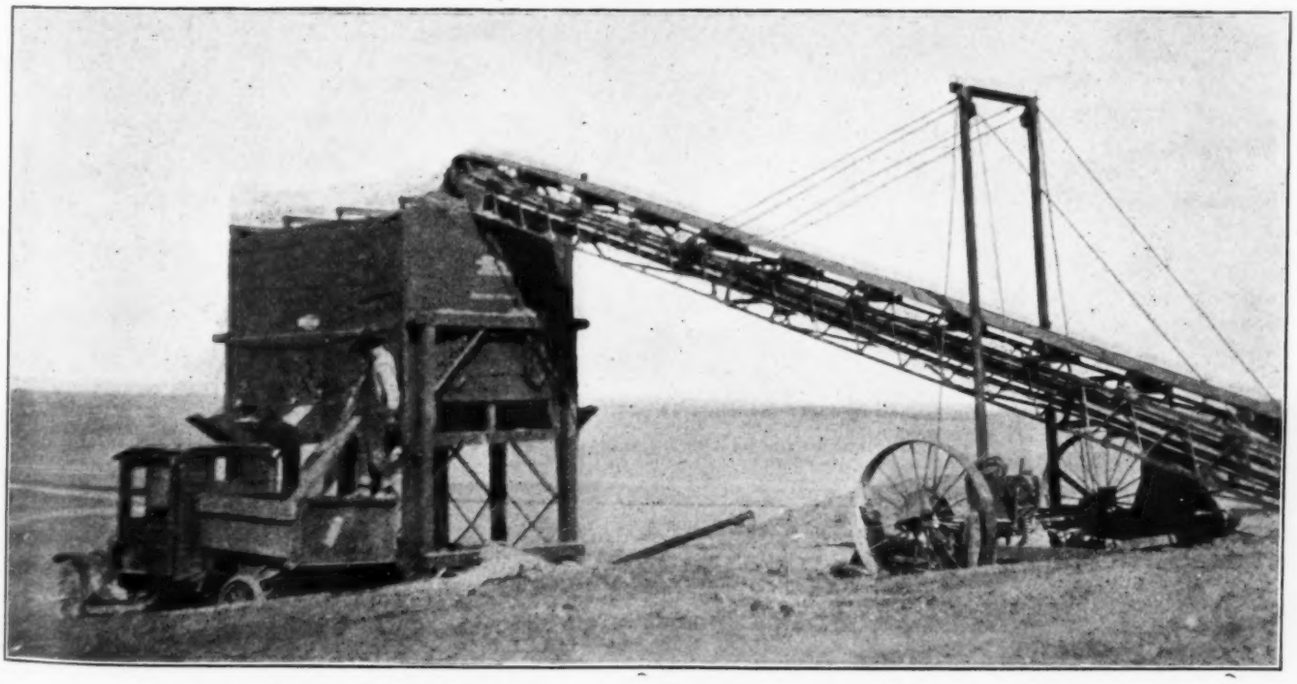
THE two photographs on this page show how Tyler & Baker of Odin, Wyoming, are using a portable conveyor as part of their equipment for getting out gravel to use in surfacing roads.

The upper photograph shows the setup used this year. The plant handled 300 yd. a day. Three teams with fresnos brought the material to the conveyor hopper and the conveyor then transferred it to the screening plant, as shown in the photograph. Before going on the conveyor the material passed through a screen and all oversize was thus eliminated.

In the upper left-hand corner of the photograph the tops of the heads of two horses may be seen. They are just bringing up a load of material which will be dumped on the grizzly bar screen, then taken by the conveyor to the revolving screen which, after it has sifted out the fine material, deposits the remainder in chutes which carry it to the crusher. After being crushed, the material is returned in the buckets shown on the right of the photograph to the revolving screen and rescreened. On this particular installation the conveyor handled the material faster than the screen and crusher could take care of it.

The lower photograph shows Tyler & Baker's installation last year at Rock Springs, Wyoming, where the material from three fresnos was handled by the conveyor without difficulty. On one day this machine handled 435 cu. yd. of gravel and in one stretch of eleven working days averaged over 400 yd. per day.

Wyoming is a State which, because of its undeveloped condition, has a great mileage of gravel roads, and plants such as these which can be moved from place to place at comparatively little expense, are money makers for their owners.

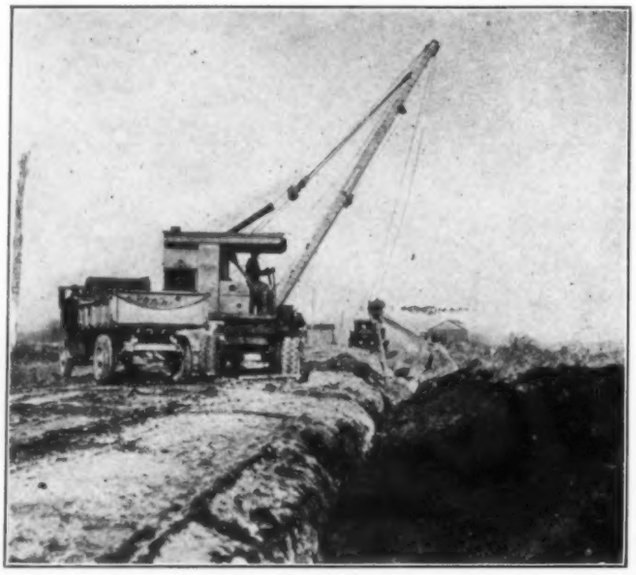


TWO METHODS OF USING CONVEYOR IN GETTING OUT GRAVEL FOR ROAD SURFACING

CLEANING DITCHES AND REMOVING SLIDES

IN the hilly southeastern section of Ohio the highways are often obstructed by landslides and ditches are always being buried by slips. The State Highway Department has developed a highly efficient method of cleaning up work of this kind and keeping the highways in good condition.

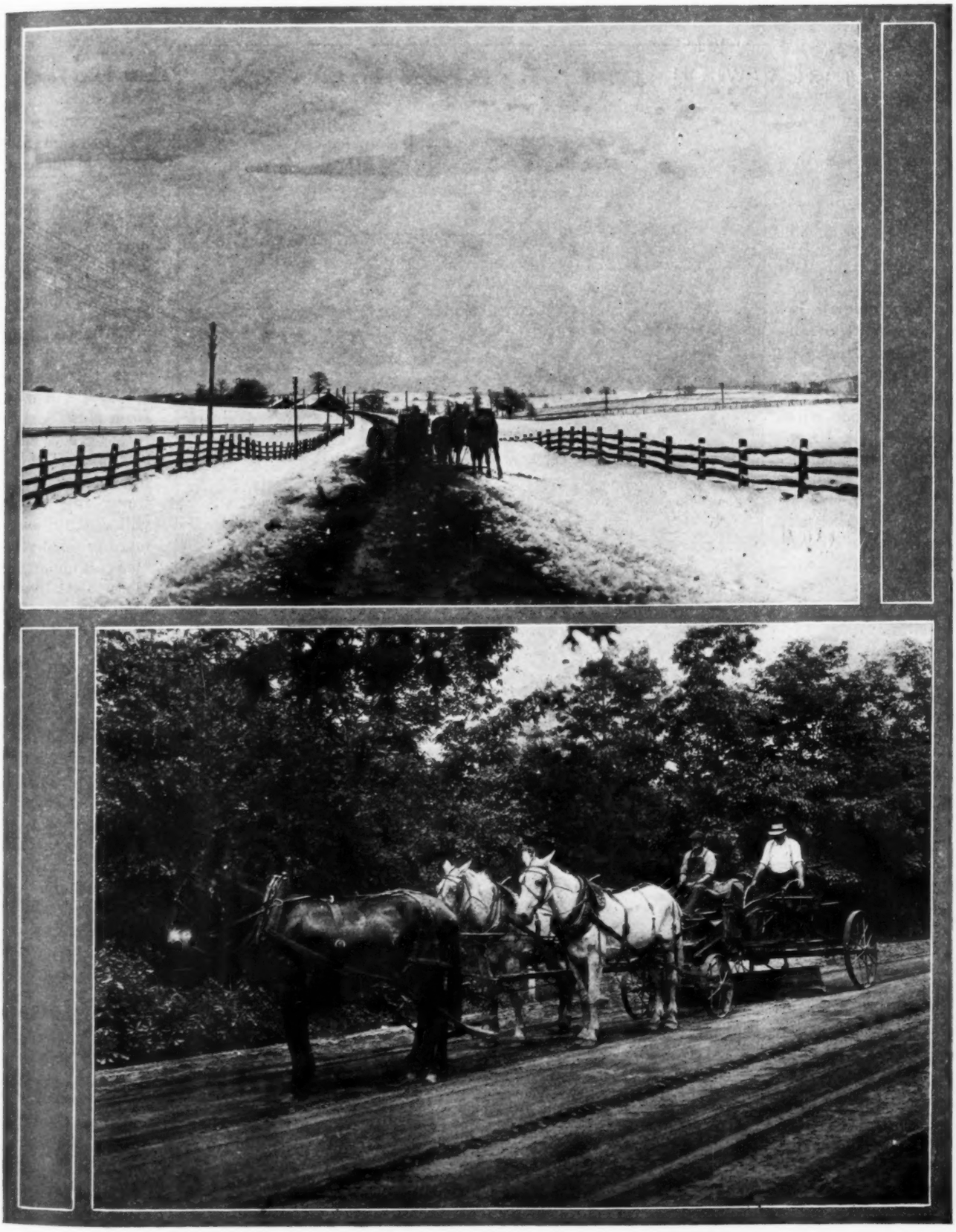
The department motor truck mounted cranes and fleets of 3½-ton dump trucks are used. Whenever a slide occurs a crane and trucks are instantly dispatched to the scene. A minimum amount of time is lost because the crane can travel equally as fast as the dump trucks and all arrive together.



The rest of the time each crane is assigned to the county supervisors, each keeping it for a certain length of time. It is employed by them to remove slips and rebuild ditches, as shown in the accompanying photograph. Throughout the summer and fall an average of 100 2½-yd. trucks a day has been maintained on slip work.

CRANE DIGS DITCHES AND CLEANS UP LANDSLIDES

Modern Road Maintenance



Clearing the roads of snow in winter is as important a part of maintenance as keeping them in shape by frequent attention in the summer. The upper photograph was taken in Pennsylvania and the lower one in New Jersey.

NEW JERSEY TO BUILD GREAT HIGHWAY

Work to Begin Soon on Connecting Link with Vehicular Tunnels to Cost $29,000,000

THAT New Jersey is going to do its full share to take care of the traffic which will pass through the Holland Tunnel when it is opened in 1926 is made certain by the plans for a 13-mile highway just announced by Major W. G. Sloan, State Highway Engineer. This highway, which will connect with the Lincoln Highway west of Elizabeth, will differ in many respects from any other road in the United States. It will begin with a viaduct 2500 ft. long leading from the mouth of the tunnel to Jersey City Heights and then will enter a covered cut which will carry it through the business section of the city. The viaduct will have a width of 80 ft. between curbs, and in the covered section ramps will be provided by which the cross streets may be reached.

Grade crossings will be eliminated on the new highway and either tunnels or bridges will take care of the crossing of the Hackensack and Passaic rivers. The total cost of the road is estimated at approximately $29,000,000 and Major Sloan has announced that contracts will be let at an early date for the beginning of the work, so that at least part of the road will be ready when the tunnel is opened.

Estimates of the traffic which will pass through the Holland Tunnel from New York to New Jersey, made by Major Sloan, indicate that at times this traffic will reach a maximum of 5500 vehicles an hour, or more than twice the traffic on Fifth Avenue, New York.

The plans for this highway include the widening of some roads toward the north, so as to provide outlet in that direction as well as the connection with Lincoln Highway.

The sketch on this page was prepared by the New Jersey Highway Commission and shows the viaduct in the right foreground. The road, after it emerges from the covered cut, may be seen in the center and left foreground. Contracts for this work will be let at an early date.

RESURFACING WORN OUT PAVEMENTS WITH SHEET ASPHALT

Old Brick Streets Covered with Thin Layer

By Ivan E. Houk

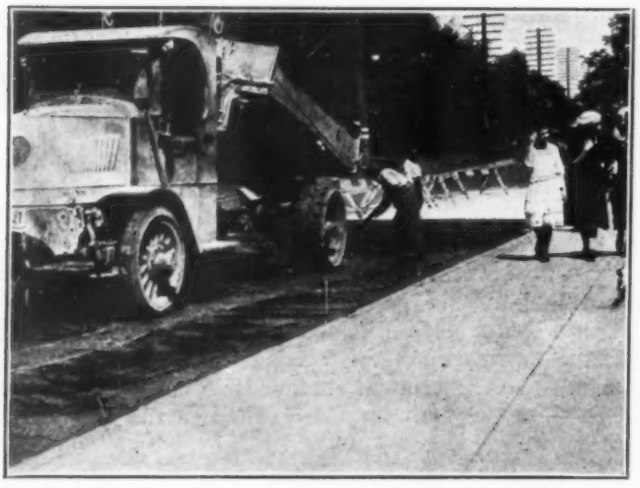
MANY cities throughout the country are rapidly transforming their worn-out pavements into first class boulevards by resurfacing with sheet asphalt. This can be done on practically any type of pavement, provided the original base course is in satisfactory condition. Dayton, Ohio, has been resurfacing her worn-out brick streets in this manner for about four years—with nothing but satisfactory results as yet.

The new surfaces are laid in varying depths, depending on the thickness necessary to obtain a smooth surface. On streets carrying car tracks the shoulders are resurfaced with courses varying from 0 to 1 in. in depth, averaging about ½ in. Such work has cost approximately 49 cents per sq. yd., exclusive of overhead. Sections laid in this way have given satisfactory service for more than three years with no indication whatever of the asphalt pulling loose from the original surface, even where the new course thins out to a feather edge. Other streets are resurfaced with courses from 0 to 3 in. in depth, averaging about 2 in. at a cost of about 85 cents per sq. yd., exclusive of overhead.

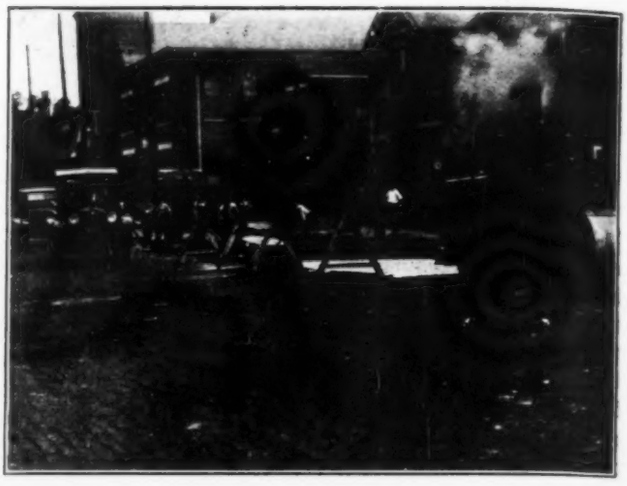
The section of the street to be resurfaced is first thoroughly cleaned of all foreign matter by sweeping with hand brooms. The larger depressions and pot holes are then filled with an asphaltic binder course of stone mixed with asphalt, or with concrete; the bad places in the gutters are rebuilt; and the loose brick are relaid or replaced by concrete. A thin sprinkling of pure heated asphalt is then applied. This seems to produce a more effective bond between the sheet asphalt and the original surface than can be obtained if the sheet asphalt is laid directly on the old pave-

LOADING TRUCK AT ASPHALT PLANT

ment. The sheet asphalt, with a pentration of from 45 to 50, and heated to a temperature a little over 300 deg. Fahr., is then brought from the plant in trucks, dumped just ahead of the section already laid, shoveled into place with heated shovels and raked to a uniform surface with long shanked, heated iron rakes. It is then tamped, smoothed out with heated smoothing irons, thoroughly compacted by rolling with a 15-ton road roller, sprinkled with limestone dust and opened to traffic just as soon as possible.



DUMPING ASPHALT ON STREET



ONLY ONE SIDE OF THE STREET IS CLOSED

Shovels, rakes, smoothing irons and other tools are heated in a portable oven kept near the work; and the pure asphalt, for sprinkling the old surface, is melted in a portable kettle. Openings are left around valve boxes, manhole covers, and so forth, and after the new surface is rolled, the castings are raised to the new grade, reset in concrete, and sheet asphalt

SPREADING ASPHALT ON OLD PAVEMENT

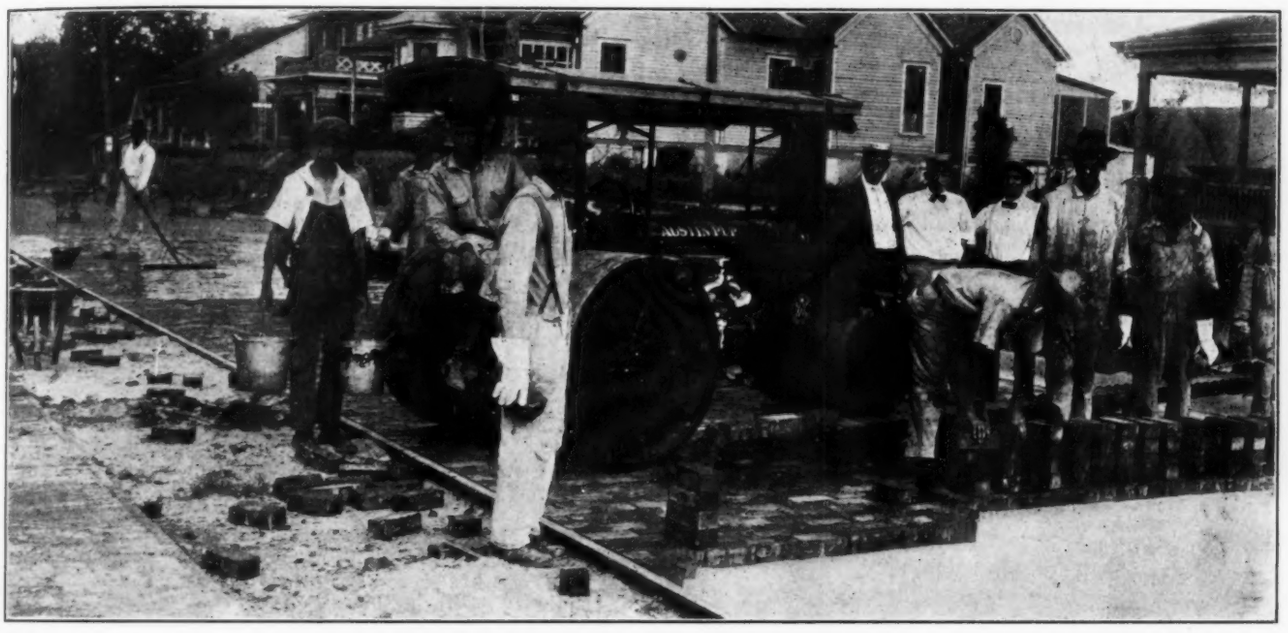
laid close around them. The new surface is generally thinned out to a feather edge at the gutters so as to avoid the necessity of building new gutters. The work is done on half the street at a time, the other half being kept open for traffic.

To date the only trouble encountered with asphalt resurfacing in Dayton was on one street running along the bottom of a hill, where the storm water run-off from the hillside got under the new surface, ripped it loose and washed it away. However, water will sometimes do this to any asphalt street, whether new or old, as was shown during the 1913 flood at Dayton, as well as during other floods elsewhere.

The work is done by the Division of Streets, the part of the Department of Public Service which takes care of street maintenance.

SMALL ROLLER CUTS PAVING COSTS

Texas Contractor Saves Money on Brick Road



ROLLING paving brick is often a rather difficult operation because of the fact that even a 5-ton roller is likely to break too many brick. The accompanying photograph shows how a contractor in Marshall, Texas, rolled paving brick set on a concrete base. He used a small roller weighing about 3 tons and it did a good job. The only brick it broke were the warped brick, which were irregular in shape and which would have had to be taken out anyway.

The small roller also had another advantage, as it could be turned around in a circle without leaving the pavement, which a larger roller could not do.

SNOW REMOVAL METHODS AND COSTS

Many States Keep Roads Clear Throughout Winter Months

By James B. McCord
Engineer in Charge, Snow Removal Investigation,
U. S. Bureau of Public Roads

THE United States Bureau of Public Roads is continuing its study and compilation of data, begun in 1922, on snow removal methods and costs among the thirty-six States that lie within the area over which snow falls to an average annual depth of 20 in. or more. The Bureau is urging the advantages of State control of such work and it is found that the number of States assuming control is increasing from year to year. Of the thirty-six States in the heavy snow area the snow removal on main roads is now being performed by well-organized State snow removal forces in twenty-one States.

It is interesting to note that approximately 62 per cent of the total motor vehicles in the Continental United States are registered in the heavy snow area and 53 per cent of the improved roads lie within that area.

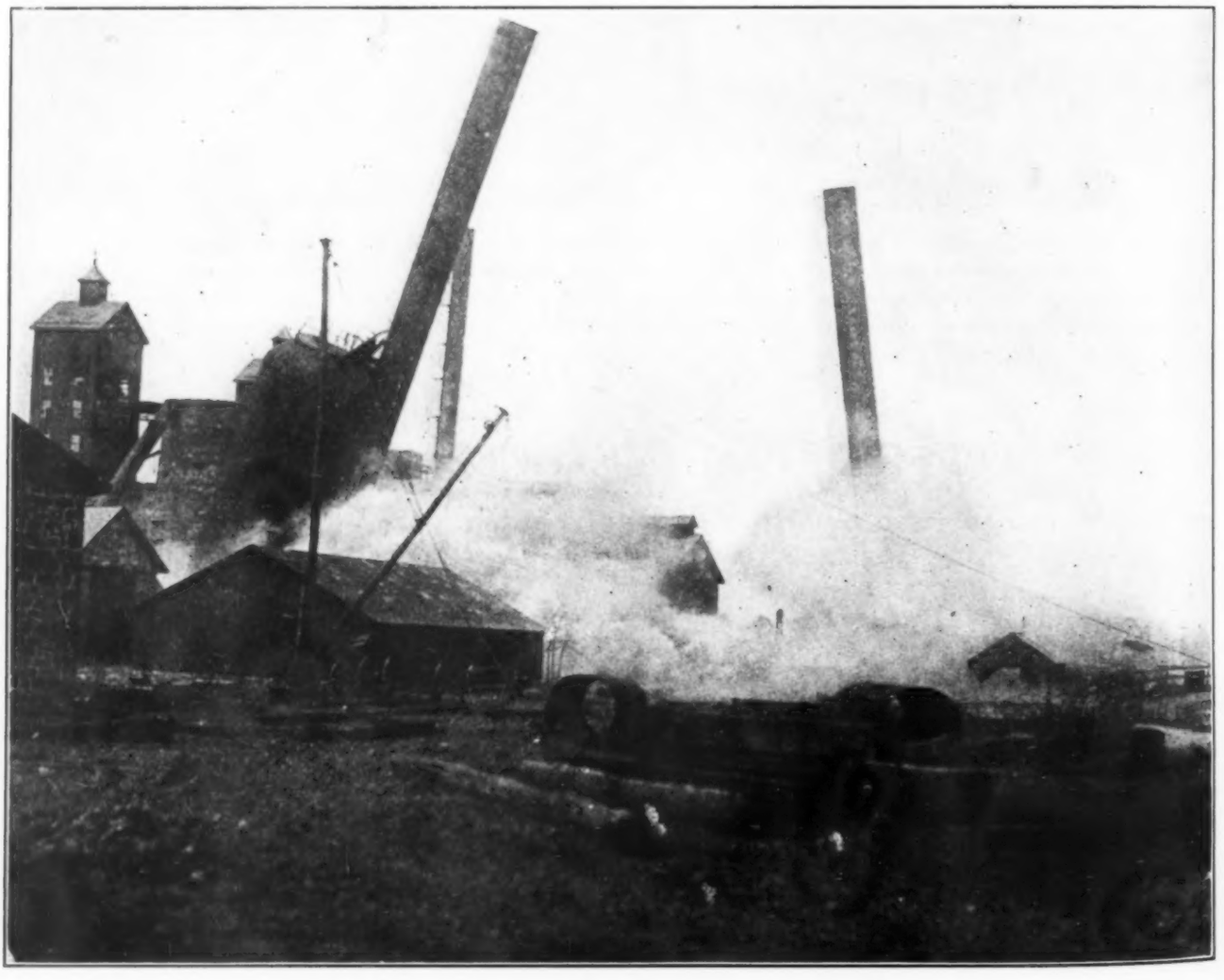
The Bureau's investigation has also developed that in the thirty-six States within this area there were, during the winter of 1922-23, over 34,000 mi. of improved main highways on definite snow removal programs. This mileage was increased for the winter of 1923-24 to over 45,000 mi., an increase of approximately 30 per cent. The States estimate a snow re-

moval program for the winter of 1924-25 of over 48,000 mi., an increase in two years of 39 per cent. The total mileage of State roads in this area (including Federal Aid roads) surfaced with gravel or higher types of pavement, as of Jan. 1, 1924, total 75,699 mi.; therefore, 64 per cent of the improved highways in the area of heavy snowfall will be on snow removal programs this winter. The cost of the work per mile cleared during the winter 1923-24 varied from $5 to $216, depending upon the locality, the amount of snow encountered and the methods employed.

It is now possible to travel over roads on definite snow removal programs from Boston, New York, Philadelphia and other large eastern cities, to Denver, Colo. Beyond that point, however, snow removal has not yet been developed sufficiently to insure open roads during the winter. This is particularly true in the mountain districts. State authorities in mountain States are, however, making serious studies and experiments in modern machinery such as rotary plows, steam shovels, etc., with a view to developing efficient snow removal methods in the mountain passes. The Continental Divide is at the present time a real divide insofar as motor vehicle traffic is concerned.

DYNAMITE TURNS THE TRICK

Drops Tall Stacks and Ovens Without Damaging Nearby Buildings

THREE stacks and a furnace at Alburtis, Pa., which had stood since 1868 were scrapped recently. The job was handled by C. V. Weaver, dynamite expert of Easton. Two of the stacks were 175 ft. in height and 15 ft. in diameter at the base. The third was 100 ft. high and 10 ft. in diameter. The two ovens which also were destroyed were 75 ft. high and 25 ft. in diameter.

The photograph taken at the moment of the explosion shows some of the difficulties attending the job because of the proximity of other buildings. Mr. Weaver laid his plans carefully, and when the dynamite was exploded the stacks were in almost the exact spot where he had stated they would drop. The final shot, which is the one shown in the photograph, consisted of 24 charges of dynamite.